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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,913	12/13/2001	Kineo Matsui	MES1P043	3027

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EXAMINER	
HENNING, MATTHEW T	
ART UNIT	PAPER NUMBER
2131	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/889,913	MATSUI, KINEO	
	Examiner	Art Unit	
	Matthew T. Henning	2131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5 and 7-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-3,5 and 7-20* is/are rejected.

7)☐ Claim(s) *17 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/21/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

This action is in response to the communication filed on 11/7/2006.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/7/2006 has been entered.

Response to Arguments

Applicant's arguments filed 11/7/2006 have been fully considered but they are not persuasive.

Regarding applicant's argument that Inoue and Bhaskaran fail to teach or disclose "embedding the bit information is carried out when the quantized coefficients of the at least two blocks are not all equal to zero", the examiner does not find the argument persuasive. As pointed out below, Inoue embedding the bit information into quantized coefficients of the two blocks, but is silent either of the two instances i. that all the quantized coefficients are equal to zero, or ii. that the quantized coefficients are not all equal to zero. However, as pointed out below, it is implied by Inoue that the coefficients are not all equal to zero, and further it is obvious and would have been recognized that the embedding method of Inoue would apply in the case that the coefficients were not all zero. Furthermore, the argument is moot in view of the new grounds of rejection presented below in view of Inoue.

All objections and rejections not set forth below have been withdrawn.

Claims 1-3, 5, and 7-20 have been examined.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 12/21/2006 was filed after the mailing date of the RCE on 11/7/2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

Claims 17 and 18 are objected to because of the following informalities:

Claim 17 recites "An apparatus of embedding" which is not grammatically correct. The examiner suggests "an apparatus for embedding".

Claim 18 recites "An apparatus of decoding" which is not grammatically correct. The examiner suggests "an apparatus for decoding".

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 19-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 19 and 20 both recite "a recording medium" containing a program, which according to the specification pager 28 paragraph 2, includes prints with barcodes or other codes printed thereon. A reasonable interpretation of the scope of "prints with...other codes printed thereon" would include program code printed on paper, which the office has held as a computer listing *per se*, which falls under nonfunctional descriptive

language, and as such does not fall within one of the statutory categories of subject matter. See MPEP § 2106.IV.B.1(a). The examiner suggests replacing "a recording medium" with "a computer storage device", as this limitation has support in the specification and has been distinguished from the nonstatutory "prints".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 7-8, 13-14, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US Patent Number 6,477,276) hereinafter referred to as Inoue.

Regarding claim 1, Inoue disclosed a method of embedding a digital watermark in a master image (See Inoue Abstract and Figs. 12-14), said embedding method comprising the steps of: extracting blocks of a predetermined size from said master image (See Inoue Col. 45 Line 66 – Col. 46 Line 2); processing image data corresponding to each block by orthogonal transform (See Inoue Col. 46 Lines 2-5); comparing orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 46 Lines 5-15) and making the coefficients satisfy a preset order of magnitude according to bit information specified as the digital watermark(See Inoue Col. 46 Lines 16-30); quantizing the coefficients obtained by the orthogonal transform with a quantization table and using the quantized coefficients to embed the bit information (See Inoue Col. 46 Lines 9-39), and processing each block with the embedded bit information by inverse orthogonal transform, so as output a

resulting image with digital watermark embedded therein (See Inoue Col. 46 Lines 30-39), but failed to specifically disclose wherein embedding the bit information is carried out when the quantized coefficients of the at least two blocks are not all equal to zero. However, Inoue did disclose determining a mean, or the average, between coefficients (See Inoue Col. 46 Lines 16-30), which implies that the coefficients have values other than zero. Furthermore, it was well known in the art at the time of invention that quantized coefficients of image data include non-zero coefficients. As such, it would have obvious to one of ordinary skill in the art that because the data being marked by Inoue is digital image data, that the quantized coefficients of a block of data (8x8) included non-zero coefficients. This is further evidenced by the fact that Inoue is dealing with multiple 8x8 blocks of coefficients, and in the best case scenario there is only 1 out of 4096 (64^2) possible combinations of coefficients, assuming each coefficient is either zero or non-zero, where all the coefficients are zero. All of the 4095 other combinations contain non-zero coefficients.

Regarding claim 17, Inoue disclosed an apparatus of embedding a digital watermark in a master image (See Inoue Abstract and Figs. 12-14), said digital watermark embedding apparatus comprising: block extraction means that extracts blocks of a predetermined size from said master image (See Inoue Col. 45 Line 66 – Col. 46 Line 2); transformation means that processes image data corresponding to each block by orthogonal transform (See Inoue Col. 46 Lines 2-5); bit information embedding means that compares orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 46 Lines 5-15) and making the coefficients satisfy a preset order of magnitude according to bit information specified as the digital watermark, so as to embed the information (See Inoue Col. 46 Lines 16-

30); quantizing the coefficients obtained by the orthogonal transform with a quantization table and using the quantized coefficients to embed the bit information (See Inoue Col. 46 Lines 9-39), and output means that processes each block with the embedded bit information by inverse orthogonal transform, so as output a resulting image with digital watermark embedded therein (See Inoue Col. 46 Lines 30-39), but failed to specifically disclose wherein embedding the bit information is carried out when the quantized coefficients of the at least two blocks are not all equal to zero. However, Inoue did disclose determining a mean, or the average, between coefficients (See Inoue Col. 46 Lines 16-30), which implies that the coefficients have values other than zero. Furthermore, it was well known in the art at the time of invention that quantized coefficients of image data include non-zero coefficients. As such, it would have obvious to one of ordinary skill in the art that because the data being marked by Inoue is digital image data, that the quantized coefficients of a block of data (8x8) included non-zero coefficients. This is further evidenced by the fact that Inoue is dealing with multiple 8x8 blocks of coefficients, and in the best case scenario there is only 1 out of 4096 (64^2) possible combinations of coefficients, assuming each coefficient is either zero or non-zero, where all the coefficients are zero. All of the 4095 other combinations contain non-zero coefficients.

Regarding claim 19, Inoue disclosed a recording medium in which a program for embedding a digital watermark in a master image is recorded in a computer readable manner(See Inoue Abstract and Figs. 12-14), said program causing a computer to attain the functions of: extracting blocks of a predetermined size from said master image (See Inoue Col. 45 Line 66 – Col. 46 Line 2); processing image data corresponding to each block by orthogonal transform (See Inoue Col. 46 Lines 2-5); comparing orthogonal transformed coefficients between at least

two blocks having a predetermined relationship with each other (See Inoue Col. 46 Lines 5-15) and making the coefficients satisfy a preset order of magnitude according to bit information specified as the digital watermark, so as to embed the information (See Inoue Col. 46 Lines 16-30); quantizing the coefficients obtained by the orthogonal transform with a quantization table and using the quantized coefficients to embed the bit information (See Inoue Col. 46 Lines 9-39), and processing each block with the embedded bit information by inverse orthogonal transform, so as output a resulting image with digital watermark embedded therein (See Inoue Col. 46 Lines 30-39), but failed to specifically disclose wherein embedding the bit information is carried out when the quantized coefficients of the at least two blocks are not all equal to zero. However, Inoue did disclose determining a mean, or the average, between coefficients (See Inoue Col. 46 Lines 16-30), which implies that the coefficients have values other than zero. Furthermore, it was well known in the art at the time of invention that quantized coefficients of image data include non-zero coefficients. As such, it would have obvious to one of ordinary skill in the art that because the data being marked by Inoue is digital image data, that the quantized coefficients of a block of data (8x8) included non-zero coefficients. This is further evidenced by the fact that Inoue is dealing with multiple 8x8 blocks of coefficients, and in the best case scenario there is only 1 out of 4096 (64^2) possible combinations of coefficients, assuming each coefficient is either zero or non-zero, where all the coefficients are zero. All of the 4095 other combinations contain non-zero coefficients.

Regarding claim 13, Inoue disclosed a method of decoding a digital watermark from a master image with the digital watermark embedded therein (See Inoue Fourth Embodiment Beginning in Col. 48), said decoding method comprising the steps of: extracting blocks of a

predetermined size from said master image (See Inoue Col. 48 Lines 54-62 and Col. 45 Line 66 – Col. 46 Line 2); processing image data corresponding to each block by orthogonal transform (See Inoue Col. 48 Lines 54-62 and Col. 46 Lines 2-5); and comparing orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 48 Lines 62-67 and Col. 46 Lines 5-15) and extracting bit information, based on a preset order of magnitude that is applied to the coefficients (See Inoue Col. 49 Lines 28-38).

Regarding claim 18, Inoue disclosed an apparatus of decoding a digital watermark from a master image with the digital watermark embedded therein (See Inoue Fourth Embodiment Beginning in Col. 48), said digital watermark decoding apparatus comprising: block extraction means that extracts blocks of a predetermined size from said master image (See Inoue Col. 48 Lines 54-62 and Col. 45 Line 66 – Col. 46 Line 2); transformation means that processes image data corresponding to each block by orthogonal transform (See Inoue Col. 48 Lines 54-62 and Col. 46 Lines 2-5); and bit information extracting means that compares orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 48 Lines 62-67 and Col. 46 Lines 5-15) and extracting bit information, based on a preset order of magnitude that is applied to the coefficients (See Inoue Col. 49 Lines 28-38).

Regarding claim 20, Inoue disclosed a recording medium in which a program for decoding a digital watermark from a master image with a digital watermark embedded therein is recorded in a computer readable manner (See Inoue Fourth Embodiment Beginning in Col. 48), said program causing a computer to attain the functions of: extracting blocks of a predetermined size from said master image (See Inoue Col. 48 Lines 54-62 and Col. 45 Line 66 – Col. 46 Line 2); processing image data corresponding to each block by orthogonal transform (See Inoue Col.

48 Lines 54-62 and Col. 46 Lines 2-5); and comparing orthogonal transformed coefficients between at least two blocks having a predetermined relationship with each other (See Inoue Col. 48 Lines 62-67 and Col. 46 Lines 5-15) and extracting bit information, based on a preset order of magnitude that is applied to the coefficients (See Inoue Col. 49 Lines 28-38).

Regarding claims 2 and 14, Inoue disclosed that the predetermined relationship between the at least two blocks is an arrangement of contiguity (See Inoue Fig. 13).

Regarding claim 3, Inoue disclosed that the orthogonal transform is a discrete cosine transform (See Inoue Col. 6 Lines 4-7).

Regarding claim 7, Inoue disclosed introducing a logic function that is true when a difference between the orthogonal transformed coefficients of the at least two blocks having the predetermined relationship is in a preset range; and modifying a procedure adopted to embed the bit information, based on the true and false state of the logic function (See Inoue Col. 47 Lines 32-36 and Col. 40 Lines 1-30).

Regarding claim 8, Inoue disclosed providing a secret key corresponding to each coefficient (See Inoue Col. 47 Lines 32-36 and Col. 40 Lines 1-30 Logical Value), and modifying the procedure adopted to embed the bit information, based on the secret key corresponding to each coefficient and the true and false state of the logic function with regard to the coefficient (See Inoue Col. 40 Lines 1-30).

Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claims 4 and 13 above, and further in view of Vora (US Patent Number 6,463,162).

Inoue disclosed embedding data in the coefficients of discrete cosine transformed blocks (See Inoue Col. 46 Lines 1-39), but failed to disclose converting the image to the luminance-chrominance space prior to applying DCT to the blocks.

Vora teaches that in order to increase the space available for embedding, an image should be converted to the luminance-chrominance space prior to embedding (See Vora Col. 4 Lines 4-10).

It would have been obvious to the ordinary person skilled in the art at the time of invention to employ the teachings of Vora in the watermarking system of Inoue by converting the image to the luminance-chrominance space prior to watermarking. This would have been obvious because the ordinary person skilled in the art would have been motivated to increase the increase the information content of the watermark.

Claims 9-10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claim 1 above, as evidenced by Johnson et al. ("Exploring Steganography: Seeing the Unseen") hereinafter referred to as Johnson.

Inoue disclosed providing a basic pattern as information of the digital watermark (See Inoue Col. 4 Lines 30-33), specifying each piece of binary information included in the provided basic pattern as the bit information as the bit information to be embedded (See Inoue Col. 47 Lines 32-34), and embedding the binary information of the basic pattern by setting the at least two blocks having the predetermined relationship to one unit (See Inoue Col. 47 Lines 34-47), and that embedding the basic pattern in the image data was done iteratively a predetermined number of times, when the number of elements constituting the basic pattern is greater than the number of extracted blocks (See Inoue Col. 47 Lines 48-57), but failed to disclose that the basic

pattern was defined in a two-dimensional manner as a combination of binary information. However, it was well known in the art at the time of invention that the watermark data to be embedded into an image could also be an image and therefore it would have been obvious to the ordinary person skilled in the art at the time of invention to have embedded an image into the image data of Inoue.

This is evidenced by Johnson, wherein Johnson states that the data to be embedded in an image can be anything that could be embedded into a bit stream, including plain text, ciphertext, and other images (See Johnson Page 27 Col. 2 Lines 1-3).

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claim 9 above, and further in view of Ohbuchi et al. ("Watermarking Three-Dimensional Polygonal Modals"), hereinafter referred to as Ohbuchi.

Inoue disclosed embedding information (See rejection of claim 9 above), but failed to disclose the information being a density pattern.

Ohbuchi teaches that density pattern embedding in polygonal models withstands practically every geometrical transformation attack (See Ohbuchi Page 271 Col. 1 Section 3.5).

It would have been obvious to the ordinary person skilled in the art to employ the teachings of Ohbuchi in the watermarking system of Inoue by using a density pattern as the watermark. This would have been obvious because the ordinary person skilled in the art would have been motivated to provide watermark protection to polygonal models as well as plain images.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claim 13 above, and further in view of Rhoads (US Patent Number 6,122,403).

Inoue disclosed arranging the extracted bit information to restore the basic pattern; and decoding the digital watermark from the basic pattern (See Inoue Col. 50 Lines 10-15), but failed to disclose that the extracted information contained a repetitive pattern, or restoring such a pattern.

Rhoads teaches that when watermarking an image, the watermark size should be small and the mark should be repeated many times through the image (See Rhoads Col. 69 Paragraph 1).

It would have been obvious to the ordinary person skilled in the art at the time of invention to employ the teachings of Rhoads in the watermarking system of Inoue by repeating the mark through the image multiple times. This would have been obvious because the ordinary person skilled in the art would have been motivated to allow the watermark to be recovered from only a portion of the image.

Conclusion

Claims 1-3, 5, and 7-20 have been rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew T. Henning whose telephone number is (571) 272-3790. The examiner can normally be reached on M-F 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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